REMARKS

This Amendment is in response to the Office Action mailed May 8, 2003. In the Office Action, claims 1-96 were rejected.

In this response, claims 59, 63-72, and 84 are amended and claims 1-58, 62, and 87, have been canceled without prejudice. Reexamination and reconsideration of this case is respectfully requested in view of the amendments and the following remarks.

I. DRAWINGS

In the Office Action, the drawings were objected to in light of cited informalities. In response, Applicant hereby submits Formal Figures in compliance with PTO guidelines to address the informalities cited by the draftsperson.

Applicant respectfully traverses the Examiner's objections to the drawings and respectfully submits that the drawings indeed show every feature of the invention specified in claims. As to the automatic gain control (AGC) to normalize the power of the tone or voice signal, the AGC is shown in Figure 11B at block 1124 and is further shown in Figure 11E at block 1170. As to the Goertzel filter, the Goertzel filter is shown in Figure 11B at block 1126. As to the 16 specific frequencies of the Goertzel filter, these are shown in Figure 11C. As to the elliptical infinite impulse response (IIR) filters, claims directed to these have been canceled.

II. REJECTIONS UNDER 35 U.S.C. § 103

In the Office Action, claims 1, 3-5, 14, 16-18, 59, 61-63, 72, 74-75, 84, 86-88 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,809,133 issued to Bartkowiak, et al. (Bartkowiak) in view of U.S. Patent No. 5,604,771 issued to Quiros (Quiros). Further dependent claims were rejected as being allegedly obvious over additional references.

A prima facie obviousness rejection requires that three basic criteria be met. First, there must be some teaching, suggestion, or motivation, either in the references themselves, or in the knowledge generally available to one skilled in the art, to modify the reference or to combine the references. Second, there must be some reasonable expectation of success. Finally, the prior art reference, or references when combined, must teach all of the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on the Applicant's disclosure. MPEP § 2142; In re Vaeck, 947 F. 2d. 488 (Fed. Cir. 1991).

Applicant respectfully submits that amended independent claims 59, 72, and 84 are not rendered obvious by the prior art cited by the Office Action, because there is no teaching or suggestion of the claim limitations of Applicant's amended independent claims 59, 72, and 84.

Particularly, all of Applicant's amended independent claims 59, 72, and 84 include claim limitations related to having *a core processor including at least four signal processing units to perform tone detection wherein the four signal processing units operate in parallel to execute four Goertzel filters, simultaneously, and wherein the four Goertzel filters process data frames of the tone or voice signal that are of fixed size.*

In contrast, none of the prior art references teach, suggest, or render obvious *a core processor including at least four signal processing units to perform tone detection wherein the four signal processing units operate in parallel to execute four Goertzel filters, simultaneously, and wherein the four Goertzel filters process data frames of the tone or voice signal that are of fixed size.*

Particularly, looking at the main reference, Bartokowiak, Bartokowiak teaches using a Goertzel filter having different frame lengths. (Bartokowiak, Figure 2, 124). As stated in Bartokowiak, "In the preferred embodiment, the DSP 106 performs the Goertzel algorithm utilizing a varying or differing frame size N for a plurality of DTMF frequencies to provide

increased accuracy and efficiency." (Bartokowiak, column 10, lines 32-35). In this way, Bartokowiak, increases the efficiency of its one DSP 106. Accordingly, Bartokowiak **teaches away** from Applicant's amended independent claims 59, 72, and 84, which recites *data frames that are of a fixed size.*

Bartokowiak utilizes different frame sizes to increase the efficiency of its one DSP 106. In contrast, Applicant's independent claims 59, 72, and 84 all recite *a core processor including at least four signal processing units to perform tone detection wherein the four signal processing units operate in parallel to execute four Goertzel filters, simultaneously.* This is very different from the teaching of Bartokowiak, which only teaches one DSP 106. As explained in Applicant's patent application, in one embodiment, the integrated telecommunication processor 150 includes a core processor 200 that includes four signal processors 300a-d that can operate in parallel to perform four Goertzel filters, simultaneously... thus, in four cycles of the core processor 200, 16 Goertzel filters can be computed to determine the energy levels of the tone/voice signal at 16 specific frequencies thereby achieving an efficiency of 4 to 1 (Applicant's patent application, pages 29-30).

Although, the Office Action cites Figure 7 of Bartokowiak as showing four signal processing units, Applicant respectfully disagrees. Figure 7 actually illustrates the operation of step 128 of DSP 106. As described in Bartokowiak, Figure 7 particularly shows that the "operation of the DSP 106 is represented as four blocks 151, 152, 153, 154, wherein each of the blocks determines the value in the respective sub-array that has a maximum value or gain." (Bartokowiak, Column 15, lines 18-23) (emphasis added). Thus, Bartokowiak only teaches one DSP 106 and not *a core processor including at least four signal processing units to perform tone detection wherein the four signal processing units operate in parallel to execute four Goertzel filters, simultaneously.*

Accordingly, based on the foregoing, Applicant respectfully submits that Bartokowiak neither alone, nor in combination with the other cited references, teaches, suggests, or renders obvious the claim limitations of Applicant's amended independent claims 59, 72, and 84 related to *a core processor including at least four signal processing units to perform tone detection wherein the four signal processing units operate in parallel to execute four Goertzel filters, simultaneously, and wherein the four Goertzel filters process data frames of the tone or voice signal that are of fixed size.* Therefore, Applicant respectfully submits that amended independent claims 59, 72 and 84 are not rendered obvious by the prior art and should be allowable. Further, Applicant respectfully submits that the dependent claims are allowable for being dependent upon allowable base claims.

III. INFORMATION DISCLOSURE STATEMENT

Applicants filed an Information Disclosure Statement on April 18, 2002, which the Examiner has returned stating that one publication reference was not received.

Applicant herewith submits an additional IDS citing the missing reference attached as Exhibit A.

Also, Applicant filed an Electronic Information Disclosure Statement ("EIDS") citing 33 US Patent Documents on December 5, 2003 in the above referenced application, a copy of which is attached hereto as Exhibit B.

Applicant has yet to receive an Examiner initialed record, indicating that the cited references in the above-referenced EIDS was considered.

Applicant respectfully requests a photocopy of the Examiner initialed record for the cited references in the above referenced EIDS be returned to Applicant for its files.

CONCLUSION

In view of the foregoing, it its submitted that the claims are in condition for allowance. Reconsideration of the rejection is requested. Allowance of the claims at an early date is solicited.

The Examiner is invited to contact Applicant's undersigned counsel by telephone at (714) 557-3800 to expedite the prosecution of this case should there be any unresolved matters remaining.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

Dated: July 8, 2003

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450.

Susan McFarlane — *Date* 7/8/03

EXHIBIT A

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

Sheet	1	of	1

Complete if Known	
Application Number	09/938,699
Filing Date	August 23, 2001
First Named Inventor	Raghavendra S. Prabhu
Art Unit	2643
Examiner Name	Singh, Ramnadan P.
Attorney Docket Number	42390P12533

OTHER ART - NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
		S.VARADA and R. SANKAR; Hardware Strategies for End-Point Detection, Department of Electrical Eng. University of South Florida, Tampa, FL, 33620, Published 07/03/95.	

Examiner Signature		Date Considered	

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

[1]Applicant's unique citation designation number. [2]Applicant is to place a check mark here if English language Translation is attached.

Based on PTO/SB/08B (05-03) as modified by Blakely, Sokoloff, Taylor & Zafman (wlr) 05/02/2003.
Send To: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450

E

Hardware Strategies for End-Point Detection

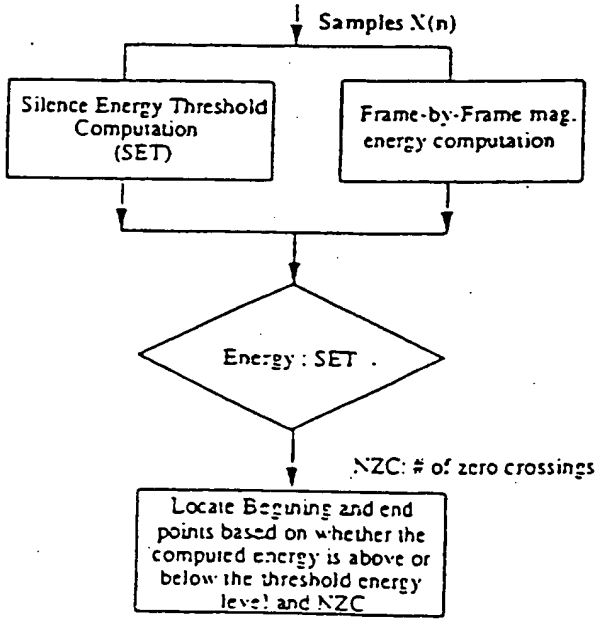
S. Varada and R. Sankar
Dept. of Electrical Eng.
University of South Florida,
Tampa, FL 33620.

p163-167 = (5)

Abstrat :End-point detection of a speech signal is an important process in isolated-word recognition. Several approaches were suggested to isolate speech signal from the back-ground noise. One such approach is using energy and zero crossing rate. In this paper, a variation of this algorithm is considered for hardware implementations for both on_the_fly (real time applications) and off_the_fly (non-real time applications) methods. This algorithm is chosen because of its simplicity and hardware suitability for implementation. The reason for hardware implementation is to achieve better speed performance over software approaches. The speed of energy magnitude computations alone, in off-the-fly approach, is O(k); where k is the frame, of arbitrary length, count. The approach in on_the_fly method although is serial, as the samples are generated on_the_fly, it is the most suitable for end-point detection implementation for real time applications.

INTRODUCTION

Recognition of speech utterance is of interest in both real and non-real time applications. Over the years much of the interest is shown in the area of isolated word recognition (references). An important step towards isolated word recognition is to separate the speech signal from background noise. This can be achieved by locating the beginning and end points of digitized speech signal. A familiar approach[1] to it was using the time domain measurements, magnitude energies (of digitized speech samples) and zero cross ing rate. The algorithm describing the procedure is shown in Fig.1. The input to this algorithm is the magnitude energies of frames of samples and magnitude energy threshold value which are calculated using the samples arise out of pre-processing on a speech signal. A block diagram depicting both pre-processing and post-processing stages towards end-point detection is shown in Fig.2.



Algorithm For End Point Detection
Fig.1

EXHIBIT B

Acknowledgment Receipt

SUBMISSION TYPE: Information Disclosure Statement
APPLICATION NUMBER: 09938699
FIRST NAMED INVENTOR: Raghavendra Prabhu
TITLE OF INVENTION: TONE DETECTION FOR INTEGRATED TELECOMMUNICATIONS PROCESSING
ATTORNEY DOCKET NUMBER: 42.P12533

FILE LISTING:

transmittal	tranEIDS1.xml	5151 Bytes
us-information-disclosure-statement	EIDS1ids.xml	12143 Bytes
us-information-disclosure-statement	us-ids.dtd	11983 Bytes
us-information-disclosure-statement	e-idssta.xsl	17508 Bytes

EFS ID: 20538
FILE SIZE: 18729 Bytes
TIMESTAMP: Thu Dec 05 18:45:58 EST 2002
MESSAGE DIGEST: k1s8dQdVZIA/Den03700Fg==
DIGITAL CERTIFICATE HOLDER NAME: cn=William E. Alford, ou=Registered Attorneys
UPLOAD STATUS: You have successfully uploaded your submission to USPTO

Electronic Information Disclosure Statement

TONE DETECTION FOR INTEGRATED TELECOMMUNICATIONS PROCESSING

Application: *09/938699*
09/938699
Confirmation: 1778
Applicant(s): Raghavendra Prabhu
Docket Number: 42.P12533
Group Art Unit: 2643
Examiner: Unknown
search string: (4,969,118 or 5,142,677 or 5,241,492 or 5,325,425 or 5,341,374 or 5,499,272 or 5,530,663 or 5,541,917 or 5,559,793 or 5,574,927 or 5,638,524 or 5,727,194 or 5,748,977 or 5,761,470 or 5,822,613 or 5,825,685 or 5,826,072 or 5,838,931 or 5,880,984 or 5,881,060 or 5,901,301 or 5,923,871 or 5,940,785 or 5,953,410 or 5,970,094 or 5,983,253 or 5,995,122 or 6,029,267 or 6,058,408 or 6,081,732 or 6,138,136 or 6,154,828 or 6,330,660).pn.

US Patent Documents

Note: Applicant is not required to submit a paper copy of cited US Patent Documents

init	Citation No.	Patent Number	Date	Bar Code	Patentee	Class	Subclass
	P01	4,969,118	Montoye, et al.	*4,969,118*	Montoye, et al.		
	P02	5,142,677	Ehlig, et al.	*5,142,677*	Ehlig, et al.		
	P03	5,241,492	Giradeau, Jr.	*5,241,492*	Giradeau, Jr.		
	P04	5,325,425	Novas, et al.	*5,325,425*	Novas, et al.		
	P05	5,341,374	Lewen, et al.	*5,341,374*	Lewen, et al.		
	P06	5,499,272	Bottomley	*5,499,272*	Bottomley		
	P07	5,530,663	Garcia, et al.	*5,530,663*	Garcia, et al.		
	P08	5,541,917	Farris	*5,541,917*	Farris		
	P09	5,559,793	Maitra, et al.	*5,559,793*	Maitra, et al.		
	P10	5,574,927	Scantilin	*5,574,927*	Scantilin		
	P11	5,638,524	Kiuchi, et al.	*5,638,524*	Kiuchi, et al.		
	P12	5,727,194	Shridhar, et al.	*5,727,194*	Shridhar, et al.		
	P13	5,748,977	Kawasaki, et al.	*5,748,977*	Kawasaki, et al.		
	P14	5,761,470	Yoshida	*5,761,470*	Yoshida		
	P15	5,822,613	Takaki, et al.	*5,822,613*	Takaki, et al.		

	P16	5,825,685	Yamane, et al.	*5,825,685*	Yamane, et al.
	P17	5,826,072	Knapp, et al.	*5,826,072*	Knapp, et al.
	P18	5,838,931	Regenold, et al.	*5,838,931*	Regenold, et al.
	P19	5,880,984	Burchfiel, et al.	*5,880,984*	Burchfiel, et al.
	P20	5,881,060	Morrow, et al.	*5,881,060*	Morrow, et al.
	P21	5,901,301	Matsuo, et al.	*5,901,301*	Matsuo, et al.
	P22	5,923,871	Gorshtein	*5,923,871*	Gorshtein
	P23	5,940,785	Georgiou, et al.	*5,940,785*	Georgiou, et al.
	P24	5,953,410	Pfeil, et al.	*5,953,410*	Pfeil, et al.
	P25	5,970,094	Lee	*5,970,094*	Lee
	P26	5,983,253	Fischer, et al.	*5,983,253*	Fischer, et al.
	P27	5,995,122	Hsieh, et al.	*5,995,122*	Hsieh, et al.
	P28	6,029,267	Simanapalli, et al.	*6,029,267*	Simanapalli, et al.
	P29	6,058,408	Fischer, et al.	*6,058,408*	Fischer, et al.
	P30	6,081,732	Suvanen, et al.	*6,081,732*	Suvanen, et al.
	P31	6,138,136	Bauer, et al.	*6,138,136*	Bauer, et al.
	P32	6,154,828	Macri, et al.	*6,154,828*	Macri, et al.
	P33	6,330,660	Ganapathy, et al.	*6,330,660*	Ganapathy, et al.

Remarks

(Remarks are not for responding to an office action.)

Applicants, in accordance with their duty of disclosure under 37 CFR 1.56 and in accordance with 37 CFR 1.97(b)(3), hereby submit this Electronic Information Disclosure Statement citing U.S. Patent Documents for consideration by the Examiner. * Pursuant to 37 CFR 1.97, the submission of this Electronic Information Disclosure Statement is not to be construed as a representation that a search has been made and is not to be construed as an admission that the information cited in this statement is material to patentability. * This Information Disclosure Statement is being filed prior to a substantive examination of the claims. Pursuant to 37 CFR 1.97(b), no fee should be required for the filing of this Information Disclosure Statement. In the event it is determined that a fee is due, please charge the fee to Deposit Account 02-2666. * Applicants respectfully requests that the cited documents be considered and that the form be initialed by the Examiner to indicate such consideration and a copy thereof be returned to Applicants' attorney of record. *

Signature

Examiner Name	Date